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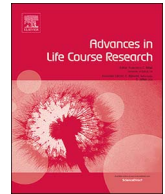
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Understanding trends in family formation trajectories: An application of Competing Trajectories Analysis (CTA)

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ABSTRACT

Over the past 50 years, family formation trajectories have undergone major changes in the events that occur as well as in the timing and order of these events. Whereas previous studies showed when and how these shifts occur, not much research has been conducted to test why these changes have taken place. This paper tests two possible explanations, namely cultural (secularization) and economic (youth unemployment) change using the Fertility and Family survey of the Netherlands conducted in 2008. We also employed a new method, Competing Trajectories Analysis (CTA), which combines features of sequence analysis and event history analysis, to examine the relationship between secularization and youth unemployment and pathways into adulthood. Our results show that the start of family formation is postponed in times of high secularization and youth unemployment, when pathways including early marriage and parenthood become less popular, and cohabiting without having children becomes more popular.

1. Introduction

Demographic pathways into adulthood have changed considerably over the past 50 years. Key markers such as leaving the parental home, marriage, and parenthood have been postponed. At the same time, other events such as entering unmarried cohabitation, having a child outside marriage, and union dissolution have gained in popularity both in the US and Europe (Billari & Liefbroer, 2010; Cherlin, 2010; Thornton, Axinn, & Xie, 2007). This has led to destandardization and diversification of family formation trajectories (Brückner & Mayer, 2005; Elzinga & Liefbroer, 2007; Shanahan, 2000). Nowadays, more variation exists in the type of family trajectories than in the past.

The literature proposes several views on why these family formation trajectories have changed. One set of explanations emphasizes cultural change, focusing on the processes of secularization and individualization that weakened social norms regarding the appropriate timing and ordering of demographic events. It has also been suggested that the emergence of new social norms has led to new typical family formation pathways (Lesthaeghe, 2010, 2014). Another set of explanations emphasizes structural and economic change, and focuses on processes of

economic globalization and concomitant changes in the welfare system that increased economic uncertainty (Blossfeld, Klijzing, Mills, & Kurz, 2005; Brückner & Mayer, 2005).

Attempts to test these competing views on the drivers of demographic change during young adulthood usually examined the influence of cultural and economic factors on single transitions such as the timing of leaving home (Aassve, Arpino, & Billari, 2013; Aassve, Cottini, & Vitali, 2013), timing of cohabitation and marriage (Sassler & Goldscheider, 2004), entry into parenthood (Sobotka, Skirbekk, & Philipov, 2011), having children within cohabitation (Schneider & Hastings, 2015), or divorce (Schaller, 2012). Studies that apply holistic methods to demographic pathways into adulthood are usually descriptive. This article aims to address this gap in the literature by testing whether changes in the demographic pathways into adulthood during the last four decades have been influenced by macro-level cultural and economic changes. Specifically, we examine the extent to which the timing of the start of family formation process and the pathways during the first five years after that start among Dutch young adults are influenced by changes in the level of secularization and youth unemployment in Dutch society. Examining the extent to which cultural

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or economic factors drive changes in the family formation process may clarify whether these changes occur as a result of a desired choice or as a form of coping with societal conditions.

To study the effect of cultural and economic macro-level changes on family pathways into adulthood, we develop a new analytical procedure, namely Competing Trajectories Analysis (CTA), based on a combination of sequence analysis (SA) and event history analysis (EHA). In many current applications of SA, the resulting pathways are strongly influenced by differences between subgroups in the timing of the first event (for most people the timing of leaving home, sometimes in conjunction with the establishment of a union or entry into parenthood). We disentangle the influence of cultural and economic change on timing and order of events by conducting an SA on demographic pathways during the first five years after young adults experienced the first event in the transition to adulthood. Next, we estimate a competing risk event history model with the resulting pathways as competing risks. This enables us to study the influence of micro- and macro-level variables on the timing of the start of the family formation process and type of pathway followed. Since competing risks models allow the inclusion of time-varying covariates, this approach provides a way to include dynamic information on changes in cultural and economic circumstances in the period leading up to the start of the process in an analysis of the interdependencies between the main events marking the transition. More generally, we suggest that the CTA procedure is useful when studying processes that start in the same initial state. This is generally the case for the family formation process—where the large majority of young people usually start by leaving the parental home—, but also applies to other situations, such as recovery from job loss where all trajectories start in the unemployed state.

To test our hypotheses on macro-level influences on family formation pathways into adulthood, we used retrospective data from the 2008 Dutch Fertility and Family survey (Statistics Netherlands, 2008). Family formation pathways can be described based on detailed information regarding leaving home, union formation and dissolution, and parenthood. The Netherlands is an ideal context to study macro-level influences on the transition to adulthood, because of the sharp increase in secularization and substantial fluctuations in economic circumstances during our time of study.

2. Hypotheses

Two narratives (Van de Kaa, 1996)—one cultural and one economic—have been dominant in explaining long-term trends in family trajectories into adulthood. The cultural narrative—usually equated with the Second Demographic Transition theory (SDT)—suggests that the growing secularization and individualization in modern societies increased the value that individuals and couples attach to autonomy and made them more reluctant to make far-reaching commitments (Lesthaeghe, 2010, 2014). Consequently, young adults increasingly postpone marriage and parenthood or even forego one or both. Furthermore, they increasingly opt for living arrangements that require less attachment to a partner, such as cohabitation and LAT (living apart together) relationships. Generally, one can argue that young adults, after leaving the parental home, are more likely to choose living arrangements that require less commitment and are more reversible, such as living alone or cohabitation. Liefbroer and Corijn (1999) suggested that living arrangements and family events can be ranked in terms of their irreversibility and required level of commitment. They argued that parenthood is irreversible, while union formation is not, and that marriage requires more long-term commitment than cohabitation. Consequently, they ranked parenthood first, followed by marriage and then cohabitation in terms of irreversibility and commitment.

Lesthaeghe (1983) emphasized the link between secularization and these family developments even before the terminology of the SDT was developed. In his view, long-term trends towards secularization not only influenced the first demographic transition—with its emphasis on

a shift from quantity to quality of children viewed as an expression of altruism—but also the second transition—with its emphasis on a shift from altruism to self-realization (Lesthaeghe, 2014). Dobbelaere (1981) described secularization as a process in which not only fewer people felt an attachment to religion and in which religion as an institution lost much of its grip on society, but also as a process in which religions became reluctant to specify their demands on followers and in which the interpretation of divine teachings became more abstract. As Christian religiosity was strongly aligned to traditional family values, both types of processes increased people's autonomy to opt for alternative living arrangements.

Much literature links individual religiosity (or parental religiosity) to family attitudes and family behaviors (e.g., Berghammer, 2012), or links country-level religiosity to country-level family formation and dissolution rates (e.g., Kalmijn, 2007). Peri-Rotem (2016) studied the changing influence of individual religiosity on fertility across cohorts in Britain, France, and the Netherlands. However, only a few studies empirically examined the link between macro-trends in religiosity and family behaviors in young adulthood. Esteve, Lesthaeghe, and Lopez-Gay (2012) observed a positive relationship between secularization and the popularity of unmarried cohabitation between 1970 and 2007 in some Latin American countries, excepting Brazil. The lack of studies that directly examined the influence of secularization on the family formation behaviors of young adults implies that the evidence about this issue is largely indirect. Individual-level studies found that religious young adults are more likely to follow traditional family trajectories into adulthood (Berghammer, 2012), including a higher likelihood to marry (Eggebeen & Dew, 2009; Manting, 1996), a smaller likelihood to cohabit (Eggebeen & Dew, 2009; Manting, 1996), early parenthood and more children (Peri-Rotem, 2016), and a smaller likelihood to divorce than non-religious young adults (De Graaf & Kalmijn, 2006). In addition, the proportion of religious young adults in Western societies is declining over time (Knippenberg, 2015). Combining these two results implies that secularization must have led to a decline of pathways that include marriage and early parenthood, and increased pathways that include unmarried cohabitation and single living.

Thus, the cultural narrative of the SDT suggests that the increasing secularization will decrease the preference for early family formation. Therefore, we expect that in more secularized times, young adults will postpone strong commitments and opt for less committal and more reversible family arrangements. Aligned to this reasoning, we formulate two hypotheses:

The higher the level of secularization, the more young adults will delay the start of the family formation process (H1).

The higher the level of secularization, the more young adults will start the family formation process via pathways that require less commitment and are more reversible (H2).

The second narrative on long-term changes in family formation processes stresses the role of economic factors. The idea that young adults postpone events that entail strong or irreversible commitments like marriage and entry into parenthood during times of economic hardship has a long tradition within demography. For example, Butz and Ward (1979) mentioned that fertility decreases during periods when the incomes of men decrease as well. This is aligned to Easterlin's (1980) thesis that children's consumption aspirations during adulthood reflect their consumption opportunities in the parental home. During economically bad times, achieving these aspirations is difficult, and young adults consequently postpone strong family commitments. Recently, these same arguments are used to discuss the family formation consequences of the Great Recession (Sobotka et al., 2011) and increasing economic globalization (Blossfeld et al., 2005). Research on the Great Recession focuses on whether the deep economic crisis of the late 2000s and early 2010s has led to a postponement of fertility as young adults become reluctant to enter parenthood during the crisis, because they are either more likely to be unemployed or less willing to jeopardize their career opportunities by having children. Globalization

Table 1
Description of covariates.

Variable	Level	Coding	Description
Age	Micro	Stand.	Standardized age of the respondent
Parental education	Micro	Stand.	Father and mother's education are coded as follows in the original data: 1) primary school or less, 2) lower secondary education, 3) upper secondary education, 4) tertiary professional education, 5) university education. We recoded this into a continuous variable using the International Standard Level of Education (ISLED) (Schröder & Ganzeboom, 2013). Finally, the average of the father and mother's education is taken to obtain one parental education score.
Parental divorce	Micro	Dummy	Information is available on whether someone experienced a parental divorce and the age at which this occurred. This information was used to create a dichotomous time-varying variable of parental divorce, in which a 0 (no parental divorce) becomes a 1 once parental divorce occurs. Those who experienced a parental divorce before age 15 start with a 1.
Practicing mother	Micro	Dummy	This binary variable is operationalized using the frequency of church visits of the mother as reported by the respondent. The categories "rarely or never" and "no church member" are coded as 0, while all the other categories ("less than once a month" or more frequently) are coded as 1.
Secularization	Macro	Stand.	Operationalized as the percentage of non-believers in the years 1970 to 2008. Missing data were imputed using linear approximation between the previous and next available years.
Youth unemployment rate	Macro	Stand.	Annual information on the percentage of unemployed people aged between 15 and 25 years from 1970 to 2008 collected by Statistics Netherlands (2012).

theory argues that economic globalization increased economic insecurity among young adults, and this economic insecurity—and related factors such as unemployment, temporary forms of employment, and low wages—increased young adults' reluctance towards far-reaching and irreversible family-related commitments. Thus, the economic situation not so much influences the preferences of young adults to make commitments, but their (perceived) opportunities to engage in such commitments.

Numerous empirical studies examined the relationship between economic trends and family behaviors in young adulthood. Youth unemployment and economic recession decreases the rate of household formation and leaving home both in Europe (Aassve, Arpino et al., 2013; Aassve, Cottini et al., 2013) and the US (Lee & Painter, 2013). Youth unemployment also delays marriage (Schaller, 2012; Schneider & Hastings, 2015). Furthermore, Schneider and Hastings (2015) found that the level of unemployment during the Great Recession positively relates to the rate of non-marital fertility. However, overall levels of fertility tend to decrease during economically bad times (Sobotka et al., 2011).

The economic narrative thus suggests that the opportunity for young adults to commit to firm family ties decreases in times of economic insecurity. Therefore, we expect that in uncertain economic times, young adults will postpone strong commitments and opt for family arrangements that are less committal and more easily reversible. Parallel to the hypotheses formulated for the cultural narrative, we formulate two hypotheses:

The less favorable the economic prospects of young adults, the more young adults will delay the start of the family formation process (H3).

The less favorable the economic prospects of young adults, the more young adults will start the family formation process via pathways that require less commitment and are more reversible (H4).

Next to these two key storylines, other narratives stress the role of institutional factors, such as the development of the welfare state and the role of educational expansion in changing the process of family formation. A strong welfare state facilitates early emancipation of young people, for instance by providing unemployment benefits, housing subsidies and bursaries that allow them to set up an independent household (Breen & Buchmann, 2002). Educational expansion influences family formation processes, because young people who are highly educated enter marriage and parenthood later than young people with low levels of education (Blossfeld & Huinink, 1989), and a general increase in the level of education will therefore lead to a general delay in the family formation process. This storyline implies that a shift in the proportion of highly educated young people drives changes in the family formation process. Clearly, these different types of narratives are interlinked, with educational expansion, individualization, and economic development partially showing parallel trends along long

time periods. Given limited information on educational trajectories in our dataset, we will focus on the role of secularization and economic development, and only present additional information on the role played by educational attainment in an Appendix.

3. Method

3.1. Data

To test our hypotheses, we used retrospective data from the Dutch 2008 Fertility and Family survey (Statistics Netherlands, 2008) on 5357 respondents. Probability sampling was used to draw a nationally representative sample from the Population Register. There was a non-response rate of 40%, which is lower than in most surveys conducted in the Netherlands (Mooyaart & Liefbroer, 2016). The survey provided weights to correct for non-response based on gender, age, level of urbanization, country of birth, marital status, and the realized number of children of women. Respondents were aged between 18 and 62 years at the time of the survey. There was an even distribution of men and women in the data, namely 51% women and 49% men.

3.2. Independent variables

In this article, we focus on the effect of secularization and youth unemployment. Beside these covariates measured at the macro level, several micro-level covariates were included as control variables including age, parental education, having a religiously practicing mother, and parental divorce. All continuous variables were standardized to facilitate the comparison of effect sizes. Table 1 provides detailed information about each of these covariates. Aside from the name of the variable, Table 1 specifies the level (micro or macro), coding (dummy or continuous standardized variable), and a detailed description.

Secularization was operationalized as the percentage of non-believers from 1970 to 2008. The data was taken from Becker and De Hart (2006). We used linear approximation to impute values for years with missing data. Youth unemployment was measured as the annual percentage of unemployed people between the ages of 15 and 25 years (Statistics Netherlands, 2012). Fig. 1 presents the evolution of these two macro-indicators in the Netherlands between 1970 and 2004. Secularization shows an almost linear evolution. Youth unemployment presents a different trend with three local maxima in 1983, 1994, and 2004, coinciding with well-known economic recessions in the Netherlands.

3.3. Dependent variable: trajectories

Family-life trajectories were built based on the main events marking

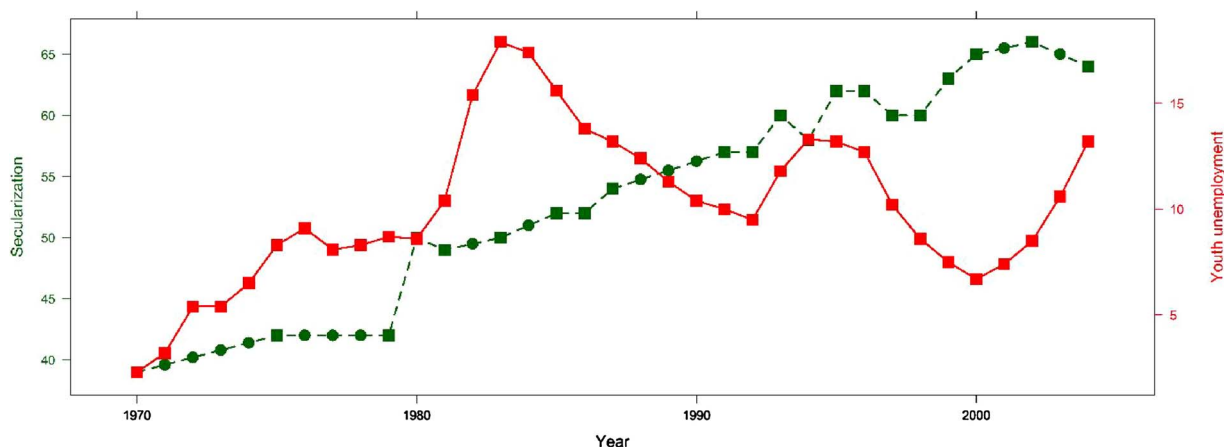


Fig. 1. Evolution of secularization (dashed line, scale on the left y axis) and youth unemployment (solid line, scale on the right y axis). For the secularization indicator, points that were imputed by linear approximation are drawn with a plain circle.

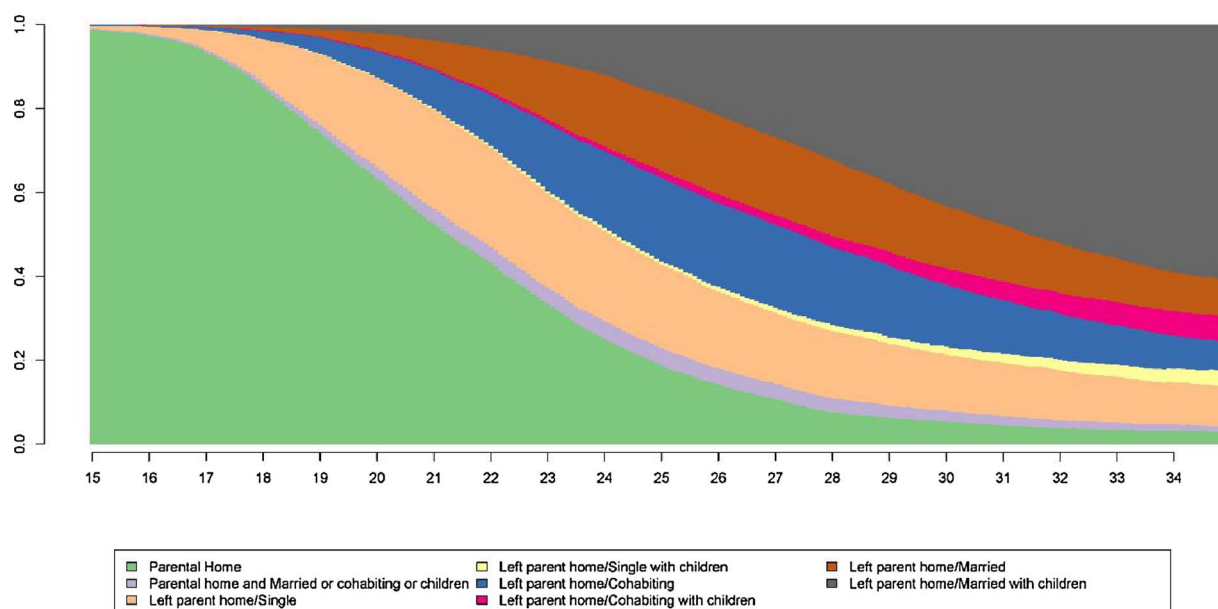


Fig. 2. Chronogram of trajectories between ages 15 and 35 years. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

the transition to adulthood. We considered the following four dimensions: leaving or returning to the parental home, starting or ending a spell of unmarried cohabitation, getting married or divorced, and having a first child (considered irreversible). Considering all possible combinations of these four dimensions is not relevant, since some combinations are rare. For this reason, we considered all situations where someone lived with parents and was simultaneously in another situation—married, cohabiting, or having children—as one state. We refer to those who are not in a union as singles. Thus, we distinguished eight possible states: (1) living in the parental home; (2) living in the parental home while being married, cohabiting, or having child(ren); (3) left parental home and single; (4) left parental home and single with child(ren); (5) left parental home and cohabiting; (6) left parental home and cohabiting with child(ren); (7) left parental home and married; and (8) left parental home and married with child(ren). Fig. 2 presents the chronogram of the trajectories between the ages of 15 and 35 years. From this, it is clear that some variation exists in the age at which young adults experience the first demographic event in the transition to adulthood. Most individuals leave the parental home during their late teens and early twenties.

3.4. Analytical approach

Family trajectories are often studied using Sequence Analysis (SA), which is based on the calculation of sequence dissimilarity between trajectories taken as a whole (Bras, Liefbroer, & Elzinga, 2010; Elzinga & Liefbroer, 2007; Robette, 2010). This holistic view of family formation pathways is achieved by considering the timing, sequencing, and spacing of family related events (Studer & Ritschard, 2016). Most of the time, these dissimilarities are computed using the optimal matching algorithm, and are subsequently used to build a typology of the trajectories using cluster analysis (See Studer, 2013 for a review). This typology is thought to summarize the main patterns of trajectories.

Alternatively, Event History Analysis (EHA) incorporates a number of methods for modeling the duration between two events, such as birth and leaving the parental home. EHA can handle censored observations and thus allows the inclusion of individuals whose trajectories are not fully observed. Furthermore, several methods within the EHA framework allow measurement of the influence of time-varying explanatory factors on the occurrence of a given event or of competing events (Courgeau & Lelièvre, 1993; Mills, 2011; Therneau & Grambsch, 2000).

SA has several advantages over the more standard EHA

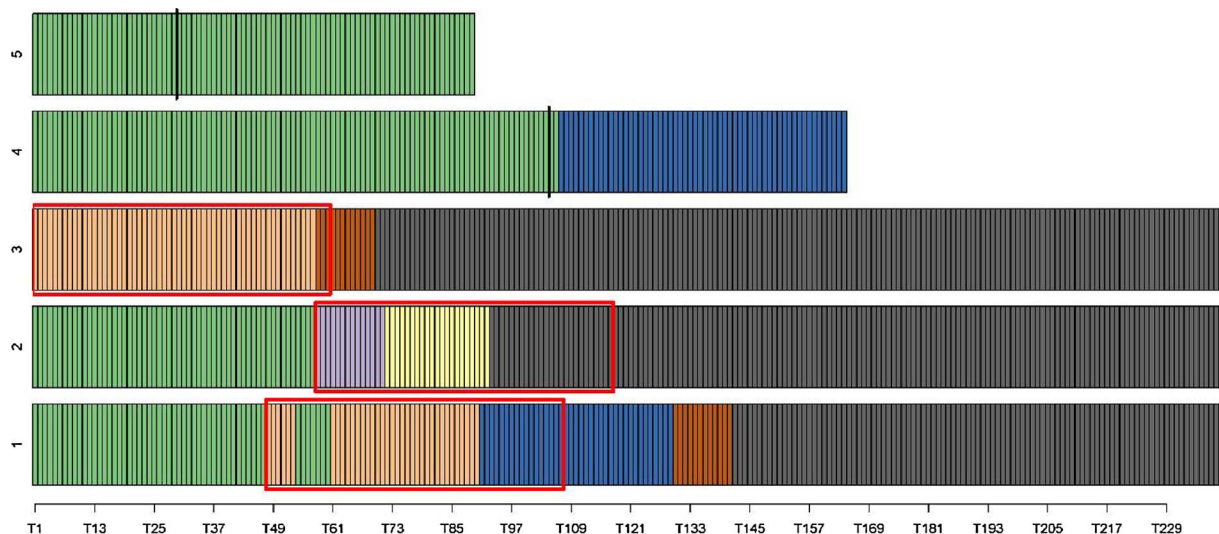


Fig. 3. Five example sequences of the transition to adulthood. The sub-sequences of events within a five-year window after the first event are highlighted by a red box. Vertical bold black bars indicate censoring. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

methodology (Halpin, 2003; Robette, 2010; Shanahan, 2000). First, EHA usually focuses on single events, and thus pays relatively little attention to interdependencies between events. Often, these interdependencies are particularly relevant. For example, according to Billari, Philipov, and Baizán (2001), the simultaneity of some events such as leaving home and marriage reveals specific social norms that should be studied on their own. Extending this interpretation, the sequencing of events conveys meaningful information that merits joint study; for example, getting married directly or after a spell of cohabitation do not reveal the same social norms.

Second, Shanahan (2000) noticed that the turning points of a trajectory such as the transition to adulthood are usually less well defined and delimited than assumed by the analysis of a single event. For example, leaving the parental home is often analyzed as a specific and unique event, even if it may be a gradual process marked by back and forth movement (Shanahan, 2000).

However, SA also has serious limitations when studying family formation trajectories. First, to avoid anticipatory analysis (Hoem & Kreyenfeld, 2006), the method can only be used to study the effect of covariates measured at the beginning of the trajectory. If we include a covariate measured later, we would explain part of the trajectory by some of its outcomes. For example, if we study the effect of the level of education at age 25 on family-life trajectories between ages 15 and 35 years, one would explain the beginning of the trajectory (from ages 15 to 25) based on future levels of education. This limitation prevents the use of time-varying factors such as parental divorce or the youth unemployment rate.

Second, if all trajectories start with the same state, the resulting typology often mainly distinguishes between trajectories that differ in the timing of the first event. For example, in the study of the transition to adulthood, the typology often distinguishes between those leaving earlier or later, but experience the same kind of process thereafter. In other words, the time spent in this first state often plays an important role in the resulting typology. Depending on the issue under investigation, this might be problematic for two reasons. First, since we usually only consider a restricted number of types (i.e., less than 10), the distinctions made according to the time spent in this first state may hide other—possibly important—distinctions, such as differences in the sequencing of states. Second, using only two or three categories (typically an early or late start) to fully describe the timing of the process might be too crude of an approximation. This is especially problematic in the study of the family formation process, where many explanatory factors such as youth unemployment are expected to postpone the

process. From a statistical perspective, using only two or three crude categories, we may fail to properly estimate postponement of the trajectories.

Third, SA aims to analyze processes holistically. For this reason, one can only analyze fully observed processes. Individuals with censored sequences (i.e., not fully observed) are usually ignored. This implies that trajectories of the youngest cohorts in a sample are often dropped from the analysis, even if these cohorts are of interest. On the other hand, EHA provides an appropriate approach to handle censored observations.

3.5. Competing Trajectories Analysis (CTA)

To overcome these limitations, we propose Competing Trajectories Analysis (CTA), a procedure which combines key elements of SA and EHA. We first use SA to study the sequencing and spacing of the main events in the family formation process. Second, we employ the EHA framework to study the timing of the start of the transition process and the kind of trajectory followed. By separating these two aspects, namely the timing of the first event and the sequencing and spacing of the events that follow the start of the family formation process, we can study the trajectory in more detail. Moreover, time-varying explanatory variables measured up to the time of the first event can be included in the analysis, enabling a better understanding of how they shape the transition to adulthood.

3.5.1. Extracting the sequences

More specifically, our method proceeded as follows. First, we analyzed sub-sequences of a predefined time span. If t is the time of the first observed event in the sequence and ℓ a predefined time span, we extracted the sub-sequences between positions t and $t + \ell$. In other words, we focused on a sub-sequence observed for a predefined time span and aligned to the first observed change in the whole sequence. Second, we studied these extracted sub-sequences using SA.

Fig. 3 shows five example of family formation trajectory sequences. We studied the sub-sequences of length $\ell = 60$ months (i.e., 5 years). For the first individual, this sub-sequence is highlighted by a red box and starts at time $t = 48$ months after the beginning of the trajectory and lasts for $\ell = 60$ months. Practically, this means that the first (green) part of the sequence—the first spell of 48 months in the “parental home” state—is not used in building the sequences, but in the second stage to study the timing at which the family formation process starts. We end with a sub-sequence starting with the event of “leaving the

parental home” and lasting for five years. In this particular case, the five-year window does not capture all events of the trajectory.

For the second individual, the extracted sub-sequence starts with another event (i.e., either starting cohabitation, getting married, or having a first child), but has the same length of $t = 60$ months. Finally, the third sequence does not start in the parental home state. In this case, we assume that the first event occurred at time $t = 1$, i.e., before the start of the sequences. For this reason, this extracted sub-sequence starts at the first time unit. However, note that with the appropriate selection of the age from which the family formation process is studied, sequences of this type will be rare.

We only extracted fully observed sub-sequences of length ℓ . This means that we did not extract sub-sequences for individuals who have not observed any event (e.g., the fifth sequence in Fig. 3) and individuals who have not been observed for ℓ time units after the first event (e.g., the fourth individual in Fig. 3). In both cases, the sub-sequences are not included in the first step of the analysis, namely the analysis of a frequent/ideal-typical combination of events. In both cases, these individuals should be considered as censored observations at time $c = L - \ell$, where L is the length of the sequence. The time limit c is justified in that after c , it is not possible to observe a full sub-sequence of length ℓ . These censor time limits are illustrated in Fig. 3 using a vertical black bar. They are included in the EHA as censored observations. The only sequences that cannot be included in the analysis are those with length L that is shorter than the sub-sequence length ℓ . In this case, the censor time limit c is negative, showing that these sequences could not be observed.

After extraction, SA methods (Abbott, 1995; Studer, 2013) can be used to cluster sub-sequences into a limited number of types. These ideal-typical sub-sequences can be interpreted as typical ways in which to start the family formation process.

3.5.2. Combining sequence analysis with event history analysis

Once the typology is built, we analyze which factors influence the type of start to the family formation process and timing using a competing risk model. The use of the EHA framework is particularly justified for two reasons. First, it allows studying the timing of the start of the transition. Second, it allows including individuals with censored observations in the analysis.

The proposed combination of EHA and SA should be mutually beneficial. The use of SA enables to cope with multiple states and events and their possible interactions, while the use of EHA makes it possible to partially handle censored observations and analyze the timing of the process. This combination does not add much complexity to the usual SA framework, where sequences are clustered before running multinomial regression. Here, we change these two steps by incorporating timing and censoring in the second one.

The behavior of the proposed analytical procedure is highly dependent on the length ℓ of the considered sub-sequence. If ℓ is long, then we analyze a large part of the sequence, which enables the study of mid- or long-term effects and interdependencies in the trajectories. At the extreme point, we are almost in the standard SA framework. We analyze only complete sequences with multinomial logistic regression and remove all incomplete sequences. The handling of censored observation is therefore irrelevant and no time-varying covariates can be studied. However, if ℓ is shorter, fewer observations are removed and fewer sequences are considered as censored. The CTA procedure can therefore better handle censored observations. Furthermore, when ℓ is short, it is more likely that time-varying covariates that operate during the period before the start of the subsequence are related to behaviors in the short following subsequence. At the extreme point, when $\ell = 1$, the analysis is equivalent to the competing risk model with similar handling of censoring and time-varying covariates. We therefore need to make a tradeoff between these two extreme points by optimizing the sub-sequence length ℓ . In this study, we opted for a sub-sequence length of 60 months (5 years). We did so for two reasons. First, the first few years

after the first event in the family formation process is often a demographically dense period, as many demographic events tend to cluster during this period (Rindfuss, 1991). Second, it seems likely that societal conditions that influence the timing of the start of the family formation process also considerably influence events in the first few years after the process starts, as young adults might already anticipate some future family-life events. If the period ℓ becomes very long, a causal effect of societal conditions at the start of period ℓ on events much later during this period becomes increasingly unlikely.

4. Results

4.1. Trajectories into adulthood

We extracted 4827 sub-sequences using the procedure described above. 10% (530) of cases were censored. Quite logically, men from later cohorts are overrepresented among the censored cases, as men family formation tends to start later among men than among women. Distances between the extracted sub-sequences were calculated using optimal matching, which is more sensitive to differences in spacing and duration than other distance measures according to simulations presented in Studer and Ritschard (2016). This is what we were looking for, since we expected increasing spacing between the events marking the transition to adulthood. Next, partitioning around medoids was used to derive a typology of pathways into adulthood (Kaufman & Rousseeuw, 2005).

We retained a typology with seven groups. The average silhouette width (0.54) of the cluster solution showed good clustering quality for a sequence analysis (Kaufman & Rousseeuw, 2005), suggesting that the clusters are distinct. Fig. 4 presents the state distribution plots for the seven pathways to enter adulthood. Note that the proportion of cases classified in each type do not include censored observations (around 10% of cases). As a recall, censored observations result from reduced observation time, or from individuals that did not experience any events. We briefly describe all pathways below, based on the most common trajectories.

- **Parental home (7%):** Individuals classified in this type start their family trajectory with an event other than leaving the parental home. As a result, they live in the parental home with a partner, a child, or both. Individuals moving back and forth from the parental home are also classified in this category.
- **Singlehood (32%):** Individuals start their transition by leaving the parental home and remain single (i.e. not in a cohabiting relationship) for the subsequent five years.
- **Singlehood-cohabitation (9%):** Individuals leave the parental home, and stay single for about two years before starting to cohabit unmarried.
- **Cohabitation (16%):** Individuals leave their parental home to cohabit for the whole period. Some experience a short episode of singlehood. As this episode is usually very short, one might think that cohabitation was already anticipated at the time of leaving the parental home.
- **Cohabitation-Marriage (6%):** These individuals leave the parental home to cohabit for an average of two years before getting married. This type might reveal a “testing” pattern in contrast to the previous type, which involves more long-term cohabitation.
- **Marriage (15%):** Individuals leave the parental home to get married immediately for the whole period of five years.
- **Marriage and Children (17%):** These individuals are characterized by a rapid process with all key events happening within a five-year window. Individuals typically leave their parental home to get married immediately before having a child in the following two or three years.

This typology highlights different ways to start the family formation

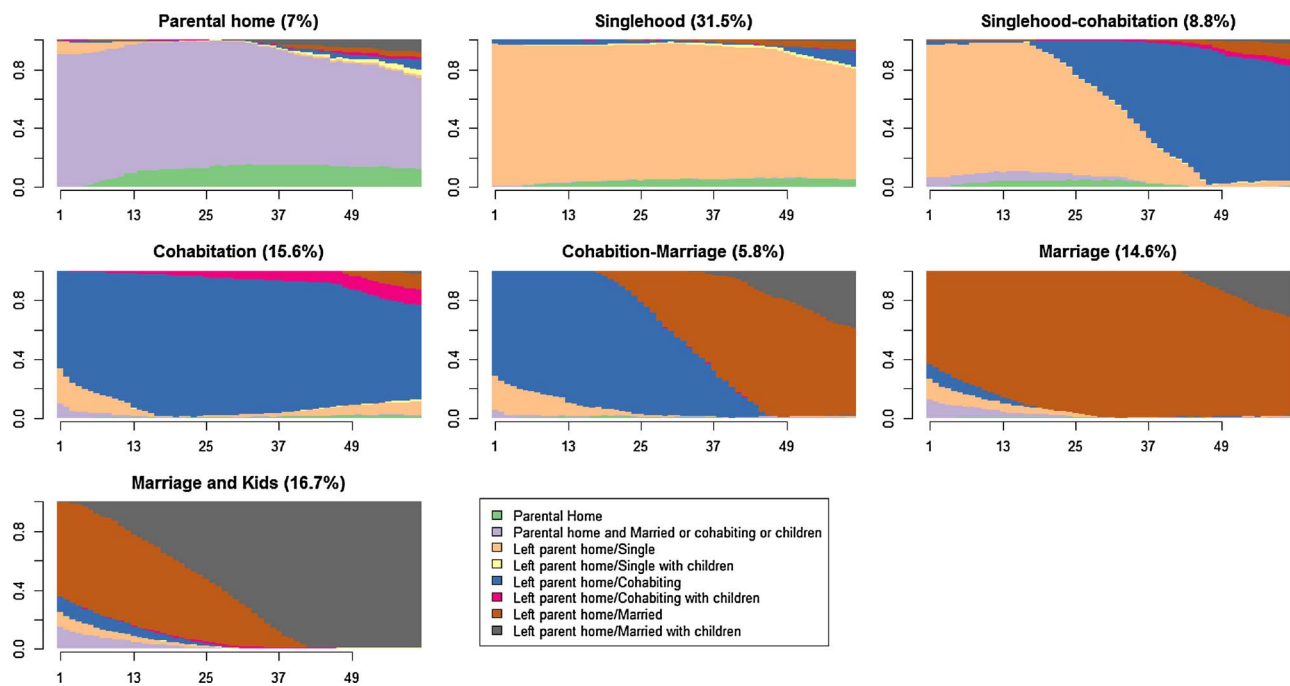


Fig. 4. Distribution plot of the typology of family formation trajectories. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

process. We now turn to the second step of our analysis, in which we studied the factors influencing the timing and kind of start of family formation trajectory using EHA.

4.2. Factors influencing the start of the transition to adulthood

Before analyzing the type of trajectories taken by young adults, we first analyze the timing of the start of the family formation process. Following our methodological approach, this start is defined by the first event marking the transition to adulthood, namely leaving home (single), unmarried cohabitation, marriage, or parenthood. Our typology highlighted that for over 90% of non-censored respondents, this event entails leaving the parental home.

We estimated a discrete time model by performing a logistic regression analysis on a monthly person-period data file starting at 15 years old. Three models were estimated separately for men and women to test our hypotheses. All models included the control variables age (as a third-degree polynomial transformation of standardized age),¹ level of parental education (standardized), having a religiously practicing mother, and parental divorce. Our time-varying macro-level covariates for secularization and youth unemployment were also standardized and added separately to Models 1 and 2 respectively. Model 3 includes both macro-covariates.² Table 2 presents the log-odds coefficients of these logistic regressions.

Our first hypothesis states that entry into adulthood is delayed in more secularized times. Generally, results are in line with H1. Model 1 shows that young men and women both tend to start the transition into adulthood later in highly secularized periods. However, the effect for women becomes statistically insignificant if we control for the unemployment rate (see Model 3). We also hypothesized that the timing of entry into adulthood is delayed in times of high youth unemployment (H3). Indeed, we observed a significant effect of the youth unemployment rate, which as expected, is associated with postponement of the

timing of the start of the transition to adulthood. This relationship is observed for men and women. These results confirm our third hypothesis.

Regarding the control variables, we observed a strong effect of the level of parental education. Young people with highly educated parents tend to start their process earlier. This could be related to more opportunities of entering higher education, which may entail that they have to leave the parental home for their education. Interestingly, the effect is significantly stronger for men than for women.³ Young adults with a religiously practicing mother tend to start their transition to adulthood later than young adults whose mother is not religiously active. Finally, we observed a strong effect for parental divorce. Individuals with divorced parents tend to start their transition to adulthood earlier than individuals whose parents did not divorce.

4.3. Factors influencing family formation trajectories

We now focus on our hypotheses regarding the influence of macro-level cultural and economic conditions on the type of family formation trajectories. To test the hypotheses, we estimated a competing risk model of the rate to experience each type of trajectory as identified in our typology. The model is estimated using a discrete time model (a multinomial regression analysis on a person-period file) and the results presented in Table 3 for women and Table 4 for men. We only present the full models, which include both the secularization and young unemployment covariates.

We first focus on the results regarding H2, namely that in more secularized times, young adults will be less likely to start the family formations process via trajectories that imply strong commitment to a partner and children. To facilitate interpretation of the results, Fig. 5 illustrates the evolution of the estimated hazard to start each for men and women in times of low and high levels of secularization. These profiles are estimated for a young adult with a reference profile, which includes the average youth unemployment rate, average parental

¹ We used a sufficiently complex transformation of age to ensure that the measured effects of the other covariates are not related to age. The degree of the polynomial was chosen by maximizing goodness-of-fit statistics on all models (see Tables 2–4).

² The operationalization of these variables is presented in the data section.

³ We tested for the significance of the difference of the coefficient of men and women by estimating a single model (for men and women together) with an interaction between sex and the level of parental education.

Table 2
Discrete Time Models of the Start of the Family formation trajectory.

	Female			Male		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Intercept	−3.65*** (0.04)	−3.66*** (0.04)	−3.65*** (0.04)	−4.49*** (0.04)	−4.51*** (0.04)	−4.50*** (0.04)
Age	1.19*** (0.05)	1.18*** (0.05)	1.19*** (0.05)	1.42*** (0.05)	1.40*** (0.05)	1.42*** (0.05)
Age ²	−1.00*** (0.07)	−1.01*** (0.07)	−1.01*** (0.07)	−0.49*** (0.07)	−0.49*** (0.07)	−0.49*** (0.07)
Age ³	0.25*** (0.04)	0.25*** (0.04)	0.25*** (0.04)	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)
Parental education	0.17*** (0.02)	0.16*** (0.02)	0.17*** (0.02)	0.23*** (0.02)	0.21*** (0.02)	0.23*** (0.02)
Practicing mother	−0.11* (0.04)	−0.09* (0.04)	−0.10* (0.04)	−0.11* (0.04)	−0.09 (0.04)	−0.10* (0.04)
Parental divorce	0.30*** (0.09)	0.30*** (0.09)	0.31*** (0.09)	0.34** (0.10)	0.32** (0.10)	0.34** (0.10)
Secularization	−0.05* (0.02)		−0.03 (0.02)	−0.08*** (0.02)		−0.07** (0.02)
Youth unemployment		−0.07*** (0.02)	−0.06** (0.02)		−0.07** (0.02)	−0.05* (0.02)
AIC	25128.01	25121.34	25121.79	23305.98	23309.88	23303.91
Num. Obs.	167546	167546	167546	204800	204800	204800

*** $p < 0.001$.

** $p < 0.01$.

* $p < 0.05$.

Table 3
Women: Competing trajectories model of the type of family formation trajectories.

	Parent.	Singl.	Singl.-cohab.	Cohab.	Cohab.-Marriage	Marriage	Marriage-kids
Intercept	−6.63***	−5.15***	−5.93***	−5.45***	−6.05***	−5.95***	−5.75***
Age	1.17***	−0.02	0.51**	1.42***	1.87***	2.46***	1.90***
Age ²	−0.34	−1.27***	−1.26***	−1.14***	−1.57***	−1.96***	−1.25***
Age ³	0.02	0.66***	0.50***	0.15	0.33	0.40**	0.27**
Parent. education	0.06	0.46***	0.33***	0.15**	0.09	−0.02	−0.50***
Pract. mother	−0.60***	0.12	−0.18	−0.57***	−0.49**	0.41***	−0.03
Parent. divorce	0.90**	0.11	0.33	0.60***	−0.38	−0.29	0.31
Secularization	−0.13	0.10**	0.09	0.51***	0.13	−0.59***	−0.36***
Youth unempl.	−0.03	−0.09*	0.07	0.11	0.11	0.10	−0.12*
Likelihood ratio	$\chi^2 = 2730.99$ (df = 56)***						

*** $p < 0.001$.

** $p < 0.01$.

* $p < 0.05$.

Table 4
Men: Competing trajectories model of the type of family formation trajectories.

	Parent.	Singl.	Singl.-cohab.	Cohab.	Cohab.-Marriage	Marriage	Marriage-kids
Intercept	−7.42***	−5.45***	−6.56***	−6.51***	−7.67***	−7.19***	−7.32***
Age	1.24***	0.09	0.97***	2.13***	2.54***	3.23***	3.34***
Age ²	−0.61	−1.06***	−0.67***	−0.60*	−0.99*	−1.51***	−1.46***
Age ³	0.10	0.55***	0.18	−0.13	0.07	0.16	0.13
Parent. education	−0.10	0.49***	0.37***	0.17**	0.09	−0.02	−0.27***
Pract. mother	−0.52*	0.04	−0.50***	−0.59***	−0.18	0.26*	0.19
Parent. divorce	0.82*	0.36*	−0.17	0.56**	0.21	0.24	−0.25
Secularization	0.06	0.05	0.22**	0.46***	0.26**	−0.64***	−0.58***
Youth unempl.	−0.02	−0.03	−0.03	0.02	0.23*	0.13*	−0.08
Likelihood ratio	$\chi^2 = 2713.25$ (df = 56)***						

*** $p < 0.001$.

** $p < 0.01$.

* $p < 0.05$.

education level, non-practicing mother, and non-divorced parents.

The results in Table 3 indicate that in times of increased secularization, women are less likely to enter the family formation process through more “traditional” trajectories that focus on marriage or

marriage and parenthood. In contrast, young adults are more likely to opt for singlehood and cohabitation trajectories. In Table 4, the results for men mirror these results. In more secularized times, men are less likely to opt for marriage and marriage and children trajectories and

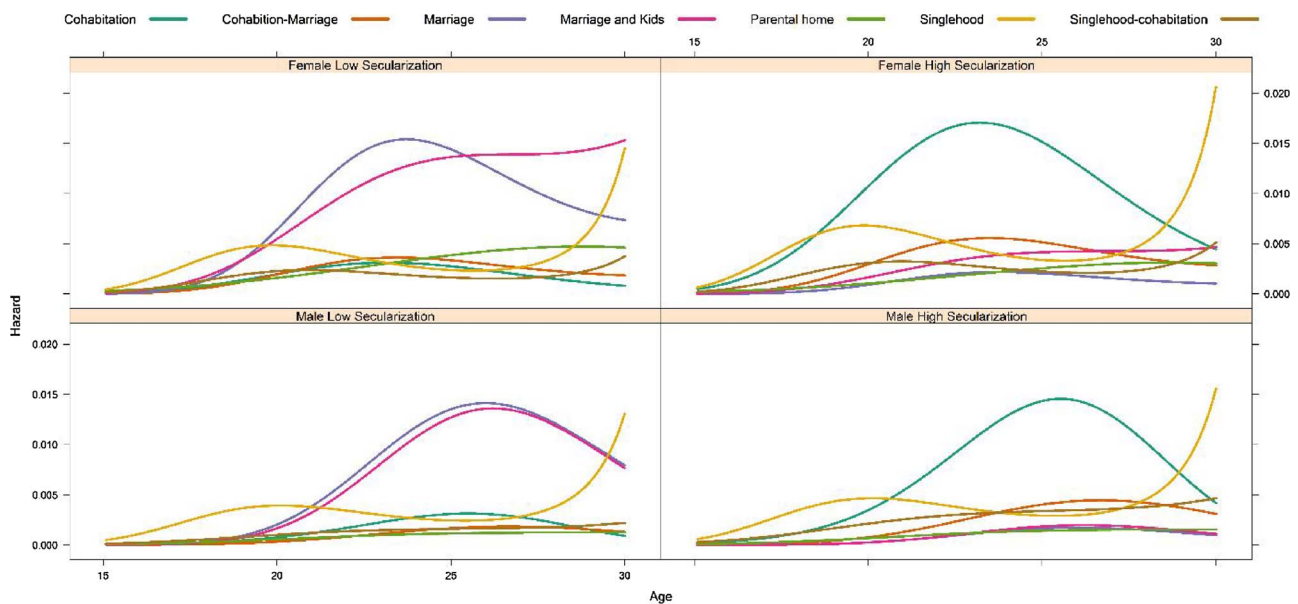


Fig. 5. Evolution of the hazard of starting each type of family formation trajectory by gender and level of secularization^a. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

^aEach line depicts the hazard of starting a particular trajectory at a given age. The hazard is computed for a person with a reference profile that includes average youth unemployment rate, average parental education level, non-practicing mother, and non-divorced parents. A separate panel is used for men and women in the context of low or high secularization. The lines are comparable across panels, but interpretation should be done with caution as no information about statistical significance is provided.

more likely to opt for trajectories that include cohabitation such as singlehood-cohabitation, cohabitation, and cohabitation-marriage. These differences are graphically represented in Fig. 5. In periods of low secularization, both genders' transition to adulthood is dominated by the two trajectories of marriage and marriage and children. The main difference is that the rates of these trajectories for men peak at a somewhat later age. Interestingly, the parental home trajectory (starting the transition with an event other than leaving the parental home) shows an increasing hazard rate with age. Women are more likely to experience it if they did not leave home until a later age. In periods of high secularization (the right-hand panels in Fig. 5), the cohabitation trajectory dominates for both women and men. For women, the singlehood trajectory also becomes more common, as does singlehood followed by cohabitation. The latter peaks at a later age than does the singlehood trajectory. Among men, an increase in the likelihood of the singlehood-cohabitation trajectory is also observed, particularly at older ages. These results confirm our second hypothesis, since we observed a rise in family formation trajectories characterized by less irreversibility and a lower commitment to a partner or children. The likelihood of cohabitation instead of marriage increases and the transition to parenthood is postponed.

Hypothesis 4 suggests that less irreversible transitions that imply a stronger commitment to a partner and children are less likely in economically bad times, even if the coefficients are less significant than the ones for secularization. The results in Tables 3 and 4 partly corroborate this. In economically bad times, women demonstrate lower rates of entering the marriage and children trajectory. However, women are also less likely to opt for a singlehood trajectory during periods of high youth unemployment, suggesting that in uncertain economic times it becomes more difficult to establish individual independence. The estimates for men in Table 4 suggest—somewhat surprisingly—that the marriage and cohabitation-marriage trajectories become more popular in periods of high youth unemployment. The results in Fig. 6 clarify these results, as they show that in periods of low unemployment men aged 25 years and more are characterized by the “cohabitation” and “marriage and children trajectories, but that in periods of high youth unemployment, the marriage trajectory replaces the marriage and children trajectory. This suggests that early fatherhood is postponed in

economically bad times.

Finally, the effects of the control variables are worth noting. Differences according to the level of parental education are similar for men and women. Those with highly educated parents have a higher likelihood to follow the singlehood or cohabitation trajectories. Conversely, the traditional marriage and children pattern (leaving home to get married immediately before having children in a five-year time span) is less likely among those with highly educated parents. Unsurprisingly, those with a religiously practicing mother are less likely to experience trajectories including cohabitation and more likely to experience marriage trajectories, but less likely to start their transition by living with a partner and/or children in the parental home. Hence, having a practicing mother tends to lead to more traditional patterns. Finally, the time-varying covariate parental divorce has a strong effect on trajectories into adulthood for men and women. Individuals with divorced parents are more likely to follow a cohabitation trajectory. Furthermore, sons of divorced parents are more likely to follow a singlehood trajectory.

5. Conclusion

Family formation processes have changed dramatically over the past decades. Not only have many demographic events been postponed, but some events that were less common in the past, such as unmarried cohabitation and divorce, have gained in popularity. Essentially, this has led to a destandardization of demographic trajectories into adulthood, which has been linked to long-term changes in societal conditions. Cultural narratives emphasize that secularization and individualization have led young adults to increasingly prefer autonomy, and this implies decreased commitment to a partner and children. Consequently, young adults postpone marriage and parenthood and opt for singlehood and unmarried cohabitation instead. Economic narratives emphasize that in economically bad times, opportunities for young adults to commit to a partner and children decline. As a result, young adults are assumed to postpone far-reaching and potentially irreversible demographic decisions during these times. The aim of this paper was to test the role of long-term period influences on the family formation process. We did so by studying changes in this process among Dutch

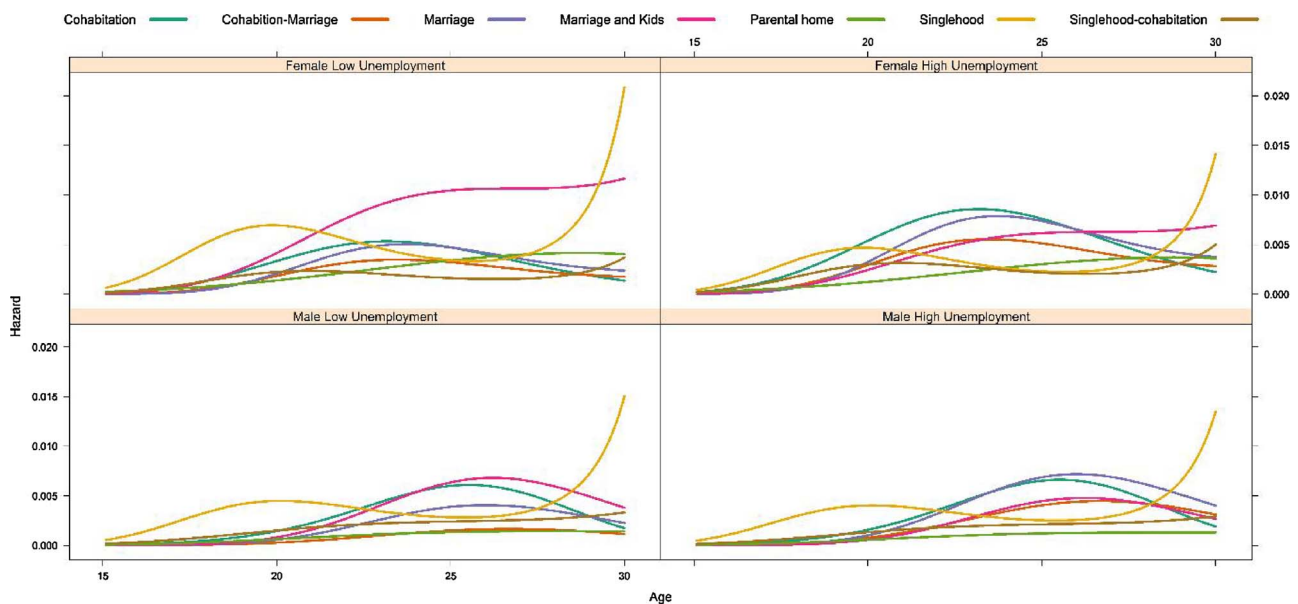


Fig. 6. Evolution of the hazard of starting each type of family formation trajectory by gender and level of unemployment^a. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

^aEach line depicts the hazard of starting a particular trajectory at a given age. The hazard is computed for a person with a reference profile that includes average level of secularization, average parental education level, non-practicing mother, and non-divorced parents. The lines are comparable across panels, but interpretation should be done with caution as no information about statistical significance is provided.

young adults between 1970 and 2008.

To test our hypotheses about the link between secularization and youth unemployment and the demographic transition into adulthood, we conducted a Competing Trajectories Analysis (CTA), a novel combination of SA and EHA. First, we conducted a SA to distinguish different trajectories starting at the time of the first demographic event in that transition (usually leaving home). Next, the trajectories were employed as competing destinations in a competing-risks EHA, which includes both time-constant and time-varying covariates influencing the timing of the start of the family formation process and the type of trajectory upon entry.

Our SA on the family formation trajectories during the first five years after Dutch young adults experienced their first demographic event distinguished seven trajectories. Excluding 10 percent of censored respondents, about one third of young adults experienced one of the two more traditional trajectories of marriage (15%) and marriage and children (17%). Next, three trajectories included cohabitation in the form of singlehood-cohabitation (9%), cohabitation (16%), and cohabitation-marriage (6%). The singlehood (32%) trajectory includes young adults who leave home, but do not yet commit to a partner or children. Finally, a seventh trajectory included young adults who experienced an event like cohabitation or marriage or parenthood, but remained at the parental home (7%).

The results of the event history models are in line with our hypotheses regarding the influence of secularization on demographic trajectories into young adulthood. The influence of secularization on the timing of the start of the family formation process was limited to men, who in more secularized times are more reluctant to start family formation than in less secularized times. In the competing trajectories model, much stronger effects of secularization were observed for the type of trajectories young adults opt for. In more secularized times, trajectories asking for a strong commitment to a partner and children are less popular. Both among men and women, the marriage and marriage and children trajectories become less popular in more secularized times. At the same time, trajectories that are more reversible and require less commitment become more popular the more secularized Dutch society becomes. This is true for the singlehood and cohabitation trajectories for women, and singlehood-cohabitation,

cohabitation, and cohabitation-marriage trajectories for men. These results are in line with the central ideas derived from the Second Demographic Transition theory, that in times of secularization young adults are more reluctant to give up their autonomy and therefore spend more time in singlehood and unmarried cohabitation during young adulthood.

The results also support the idea that economic circumstances influence family formation trajectories. Aligned to Hypothesis 3, the start of this process is postponed during times of high youth unemployment. The effects of youth unemployment on the types of trajectories taken are less pronounced, but also aligned to expectations. Among women, both the singlehood and marriage and children trajectories become less likely with increasing levels of youth unemployment. The decrease in the likelihood of the singlehood trajectory suggests that women may lack resources during economically bad times to establish an independent household, whereas the decrease in the likelihood of the marriage and children trajectory appears to indicate that they postpone childbearing until a later stage in the transition to adulthood. Both findings suggest that decreased (financial) opportunities during economically bad times weaken family commitments. Among men, the picture is less clear; the higher the level of youth unemployment, the higher the rate at which they enter the cohabitation-marriage and marriage trajectories. Still, the results in Fig. 6 indicate that the increase in these trajectories is mainly at the expense of the marriage and children trajectories. Overall, these results support our fourth hypothesis.

There are some limitations to this study. First, although our proposed method includes time-varying covariates, it is unable to consider the impact of these during the five years we studied family formation trajectories. Individuals are likely to differ in their ability to plan. Some may have a general idea about what they hope to achieve in the next five years, while others may have no idea. Second, the family formation process often takes more than five years to complete. For some individuals, we only observed the beginning rather than the full process. However, little change in effects was found if the time-span we studied was increased to six years or decreased to four. Third, we were unable to test the theoretical mechanisms behind our hypotheses. In our hypotheses, we link the choice for marriage and children to levels of commitment and irreversibility, but have no information on why

individuals choose different pathways to adulthood. For example, an important reason why marriage and parenthood is postponed may be a perceived lack of resources to afford marriage and children, but it could also be a lack of willingness to commit. Future research could examine how macro-indicators influence intentions of fertility and the reasons for postponement. Thus, this approach can only show a relationship between macro-level developments and individual-level family formation decision processes. It cannot test causal claims, as we do not examine the mechanisms linking the macro-level developments to the family formation decision processes. Finally, we only examined the role of secularization and youth unemployment in changing patterns of family formation. Other factors could be important as well. In the appendix, we examined the role of educational expansion, by adding a synthetic time-varying educational attainment variable to our models. Results show that in the Netherlands, higher educated young adults leave the parental home earlier than lower educated young adults, but that the higher educated are more reluctant to commit. However, in these analyses, the effects of secularization and youth unemployment remained quite similar to those presented in the main analyses. This suggests that educational expansion could have an impact on macro-level changes in family formation processes, but in addition to, rather than at the expense of, changes in levels of secularization and youth unemployment.

Overall, our findings support both cultural and economic narratives on changes in demographic trajectories into adulthood. Essentially, the influence of secularization seems more pervasive than that of youth unemployment. This suggests that changes in family formation processes among Dutch young adults in the last half a century are driven more strongly by a decreased preference for early commitment to family life than by a decrease in opportunities to commit to family life. Future research should examine what are the current drivers of family formation change. We speculate that future changes in family life trajectories will more likely be driven by economic rather than cultural change. First, levels of religiosity in the Netherlands appear to have stabilized (see Fig. 1), indicating that the secularization process may have reached an end. Second, we only studied changes in the family formation process until 2008, and it is likely that the impact of economic insecurity in the wake of the Great Recession has been even stronger than during the economically difficult times observed between 1970 and 2008. Indeed, in the Netherlands, it was found that during the first years of the latest economic recession young adults postponed marriage and parenthood (De Beer, 2012). Thus, the relative importance of the cultural and economic factors may change over time, and it will be interesting to examine how strong both developments are related to family formation patterns during the years of the Great Recession and its aftermath.

To study the influence of time-varying cultural and economic macro-indicators, we introduced Competing Trajectories Analysis (CTA), an innovative procedure that combines SA and EHA. SA and EHA have long been viewed as distinct approaches to modeling life courses; however, our analysis suggests that promising ways exist to combine these approaches. Several features of this approach are worth mentioning. One shortcoming of SA is that typologies are often dominated by differences in the timing of the first relevant event. Our approach allowed us to circumvent this problem, as we focused on the event sequences that occur after the first event in family formation process is experienced. This enables a typology that focuses on differences in types of events and their order, rather than on timing. Another limitation of SA is that it is difficult to incorporate time-varying information. Our approach provides an option to address this issue. Clearly, whether it makes sense to do so depends on our knowledge about the time span during which time-varying factors influence the process being studied. In this application, we assumed that macro-factors influence demographic trajectories during a period of up to five years. This assumption can easily be tested by varying the time span of the sub-sequences to be analyzed. In addition to analyzing time-varying

macro-level variables, it is also possible to include time-varying micro-level variables. In our application, we included parental divorce as a time-varying variable, but other variables such as educational enrollment and employment status can also be included. Finally, this combination allows for the inclusion of censored trajectories in the analysis, a common issue when using SA. A limitation of EHA tackled by this approach is that it is often viewed as focusing on one specific event at a time. Our approach relaxes this assumption by studying transition-to-adulthood trajectories young adults embark on once they make their first move into adulthood.

In this study, we focused on understanding temporal changes in family formation trajectories. However, this approach could also be fruitfully applied to spatial variation in such patterns. Countries, and regions within countries, vary in their level of secularization and in their socio-economic development. For instance, one could explore this regional variation to examine whether young adults in more secularized regions follow less standardized family formation trajectories. One could even combine spatial and historical variation to examine whether the same macro-factors are correlated with changes over time and with differences across space. Through these comparative approaches, life-course researchers may better understand societal influences that shape the transition to adulthood.

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References

- Aassve, A., Arpino, B., & Billari, F. C. (2013a). Age norms on leaving home: Multilevel evidence from the European Social Survey. *Environment and Planning, A*, 45, 383–401.
- Aassve, A., Cottini, E., & Vitali, A. (2013b). Youth prospects in a time of economic recession. *Demographic Research*, 29(36), 949–962.
- Abbott, A. (1995). Sequence analysis: New methods for old ideas. *Annual Review of Sociology*, 21, 93–113.
- Becker, J. W., & De Hart, J. (2006). *Godsdienstige veranderingen in Nederland. Verschuivingen in de binding met de kerken en de christelijke traditie [Religious changes in the Netherlands. Shifts in commitment to denominations and the Christian tradition]*. The Hague: Social Cultural Planning Agency.
- Berghammer, C. (2012). Family life trajectories and religiosity in Austria. *European Sociological Review*, 28(1), 127–144.
- Billari, F. C., & Liefbroer, A. C. (2010). Towards a new pattern of transition to adulthood? *Advances in Life Course Research*, 15(2–3), 59–75.
- Billari, F. C., Philipov, D., & Baizán, P. (2001). Leaving home in Europe: The experience of cohorts born around 1960. *International Journal of Population Geography*, 7(5), 339–356.
- Blossfeld, H. P., & Huinink, J. (1989). Human capital investments or norms of role transition? How women's schooling and career affect the process of family formation. *American Journal of Sociology*, 97, 143–168.
- Blossfeld, H.-P., Klijzing, E., Mills, M., & Kurz, K. (Eds.). (2005). *Globalization, uncertainty and youth in society*. London: Routledge.
- Brückner, H., & Mayer, K. U. (2005). De-standardization of the life course: What it might mean? And if it means anything, whether it actually took place? *Advances in Life Course Research*, 9, 27–53.
- Bras, H., Liefbroer, A. C., & Elzinga, C. H. (2010). Standardization of pathways to adulthood? An analysis of Dutch cohorts born between 1850 and 1900. *Demography*, 47, 1013–1034.
- Breen, R., & Buchmann, M. (2002). Institutional variation and the position of young people: A comparative perspective. *Annals AAPSS*, 580, 288–305.
- Butz, W. P., & Ward, M. P. (1979). The emergence of countercyclical U.S. fertility. *American Economic Review*, 69(3), 318–328.
- Cherlin, A. J. (2010). Demographic trends in the United States: A review of research in the 2000. *Journal of Marriage and Family*, 72(3), 403–419.
- Courgeau, D., & Lelièvre, É. (1993). *Event history analysis in demography*. Oxford: Clarendon Press.
- De Beer, J. (2012). *Crisis in de economie, crisis in relatie- en gezinsvorming?* In:

- Bevolkingstrends, 12 November 2012. CBS, Den Haag/Heerlen.
- De Graaf, P. M., & Kalmijn, M. (2006). Change and stability in the social determinants of divorce: A comparison of marriage cohorts in the Netherlands. *European Sociological Review*, 22(5), 561–572.
- Dobbelaere, K. (1981). Trend report: Secularization: A multi-dimensional concept. *Current Sociology*, 29(2), 3–153.
- Easterlin, R. A. (1980). *Birth and fortune. The impact of numbers on personal welfare*. New York: Basic Books.
- Esgebeen, D., & Dew, J. (2009). The role of religion in adolescence for family formation in young adulthood. *Journal of Marriage and Family*, 71(1), 108–121.
- Elzinga, C. H., & Liefbroer, A. C. (2007). De-standardization of family-life trajectories of young adults: A cross-national comparison using sequence analysis. *European Journal of Population*, 23, 225–250.
- Esteve, A., Lesthaeghe, R., & López-Gay, A. (2012). The Latin American cohabitation boom, 1970–2007. *Population and Development Review*, 38(1), 55–81.
- Halpin, B. (2003). *Tracks through time and continuous processes: Transitions, sequences and social structure. Frontiers in social and economic mobility*. Cornell University.
- Hoem, J. M., & Kreyenfeld, M. (2006). Anticipatory analysis and its alternatives in life-course research. Part 1: The role of education in the study of first childbearing. *Demographic Research*, 15, 461–484.
- Kalmijn, M. (2007). Explaining cross-national differences in marriage, cohabitation, and divorce in Europe, 1990–2000. *Population Studies*, 61(3), 243–263.
- Kaufman, L., & Rousseeuw, P. J. (2005). *Finding groups in data*. Hoboken: John Wiley & Sons.
- Knippenberg, H. (2015). Secularization and transformation of religion in post-war Europe. In D. S. Brunn (Ed.), *The changing world religion map: Sacred places, identities, practices and politics* (pp. 2101–2127). Dordrecht: Springer Netherlands.
- Lee, K. O., & Painter, G. (2013). What happens to household formation in a recession? *Journal of Urban Economics*, 76, 93–109.
- Lesthaeghe, R. (1983). A century of demographic and cultural change in Western Europe: An exploration of underlying dimensions. *Population and Development Review*, 9(3), 411–435.
- Lesthaeghe, R. (2010). The unfolding story of the second demographic transition. *Population and Development Review*, 36(2), 211–251.
- Lesthaeghe, R. (2014). The second demographic transition: A concise overview of its development. *Proceedings of the National Academy of Sciences*, 111(51), 18112–18115.
- Liefbroer, A., & Corijn, M. (1999). Who, What, Where, and When? Specifying the impact of educational attainment and labour force participation on family formation. *European Journal of Population / Revue Européenne De Démographie*, 15(1), 45–75. Retrieved from <http://www.jstor.org/stable/20164054>.
- Manting, D. (1996). The changing meaning of cohabitation and marriage. *European Sociological Review*, 12(1), 53–65.
- Mills, M. (2011). *Introducing survival and event history analysis*. London: Sage.
- Mooyaart, J. E., & Liefbroer, A. C. (2016). The influence of parental education on timing and type of union formation: Changes over the life course and over time in the Netherlands. *Demography*, 53(4), 885–919.
- Peri-Rotem, N. (2016). Religion and fertility in Western Europe: Trends across cohorts in Britain, France and the Netherlands. *European Journal of Population*, 32(2), 231–265.
- Rindfuss, R. R. (1991). The young adult years: Diversity, structural change and fertility. *Demography*, 28, 493–512.
- Robette, N. (2010). The diversity of pathways to adulthood in France: Evidence from a holistic approach. *Advances in Life Course Research*, 15(2–3), 89–96.
- Sassler, S., & Goldscheider, F. (2004). Revisiting Jane Austen's theory of marriage timing: Changes in union formation among American men in the late 20th century. *Journal of Family Issues*, 25(2), 139–166.
- Schaller, J. (2012). For richer, if not for poorer? Marriage and divorce over the business cycle. *Journal of Population Economics*, 26(3), 1007–1033.
- Schneider, D., & Hastings, O. P. (2015). Socioeconomic variation in the demographic response to economic shocks in the United States: evidence from the great recession. *Demography*, 52(6), 1893–1915.
- Schröder, H., & Ganzeboom, H. B. G. (2013). Measuring and modeling education levels in European societies. *European Sociological Review*, 30(1), 119–136.
- Shanahan, M. J. (2000). Pathways to adulthood in changing societies: Variability and mechanisms in the life course perspective. *Annual Review of Sociology*, 26, 667–692.
- Sobotka, T., Skirbekk, V., & Philipov, D. (2011). Economic recession and fertility in the developed world. *Population and Development Review*, 37(2), 267–306.
- Statistics Netherlands (2008). *Onderzoek gezinsvorming – OGV 1993 1998 2003 2008 [Fertility Survey – 840 OGV 1993 1998 2003 2008]*. The Hague: Data Archiving and Networked Services <http://dx.doi.org/10.17026/dans-znk-f36y> Retrieved from.
- Statistics Netherlands (2012). CBS statline: Nationale rekeningen; Historie 1900–2012. Technical report.
- Studer, M. (2013). *Weighted Cluster Library Manual: A practical guide to creating typologies of trajectories in the social sciences with R. LIVES Working Papers*, 24. Switzerland: NCCR LIVES.
- Studer, M., & Ritschard, G. (2016). What matters in differences between life trajectories: A comparative review of sequence dissimilarity. *Journal of the Royal Statistical Society, Series A*, 179, 481–511.
- Therneau, T. M., & Grambsch, P. M. (2000). *Modeling survival data*. New York: Springer.
- Thornton, A., Axinn, W. G., & Xie, Y. (2007). *Marriage and cohabitation*. Chicago: University of Chicago Press.
- Van de Kaa, D. J. (1996). Anchored narratives: The story and findings of half a century of research into the determinants of fertility. *Population Studies*, 50(3), 389–432.